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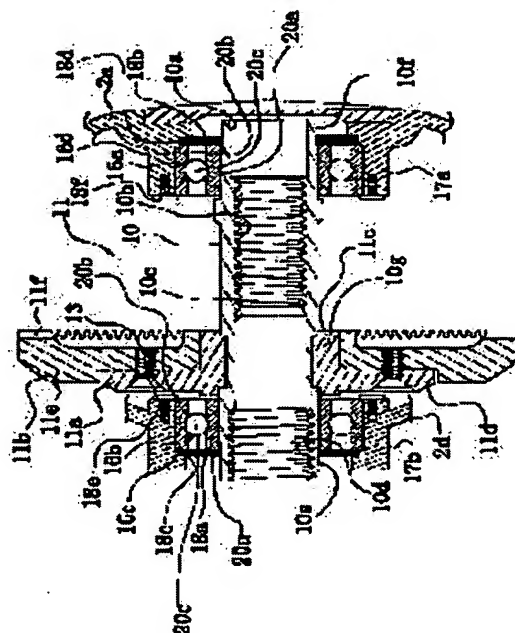
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(54) MASTER GEAR OF SPINNING REEL

(57)Abstract:

PROBLEM TO BE SOLVED: To decrease the weight of the master gear of a spinning reel and make keepable a high strength of the shaft of the reel.

SOLUTION: The master gear 11 of spinning reel is a gear for transmitting the rotation of a handle assembly 1 to a rotor 3 through a pinion gear 12 and is provided with a master gear shaft 10, a gear attaching part 11a and a gear member 11b. The master gear shaft 10 is rotatably supported at both ends by a reel main body 2 and provided with a 1st female screw 10b and a 2nd female screw 10d at both side faces. The gear attaching part 11a has a flange part 11d formed inside of the rotation supporting part of the master gear shaft 10. The gear member 11b has a disk part 11e nonrotatably attached to the flange part 11d of the gear attaching part 11a and a face gear part 11f placed on the outer circumference side of the disk part 11e and engaging with the pinion gear.



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CLAIMS

[Claim(s)]

[Claim 1] They are the master gear of the spinning reel for being supported free [a revolution] by the body of a reel of a spinning reel, and transmitting the revolution of a handle to Rota through a pinion gear. The shank by which it was supported at both ends free [a revolution] by said body of a reel, and the screw hole was formed in the ends side, The gear mounting section which has the flange prepared inside the revolution supporting section of said shank, Master gear of the spinning reel equipped with the gear member which has the disk section attached in said flange of said gear mounting section at revolution impossible, and the contrate-gear section which is prepared in the periphery side of said disk section, and gears with said pinion gear.

[Claim 2] Said gear mounting section is master gear of a spinning reel according to claim 1 currently formed in one with the same construction material as said shank.

[Claim 3] Said shank and the gear mounting section are master gear of a spinning reel according to claim 2 which are the products made from a stainless alloy.

[Claim 4] Said shanks are master gear of a spinning reel according to claim 1 said whose gear mounting section it is a product made from a stainless alloy, and is construction material different from said shank.

[Claim 5] Said gear mounting section is master gear of a spinning reel according to claim 4 which are the products made of synthetic resin.

[Claim 6] Said gear mounting section is master gear of a spinning reel according to claim 4 which are the products made from a zinc alloy.

[Claim 7] Said gear mounting section is master gear of a spinning reel according to claim 5 or 6 really fabricated by said shank.

[Claim 8] Said gear members are the master gear of a spinning reel given in either of claims 1-7 which is a product made from an aluminum forging alloy.

[Claim 9] They are the master gear of a spinning reel given in either of claims 1-7 which is the product made from a zinc die-cast alloy by which the disk section of said gear member is a product made from an aluminum forging alloy, and said contrate-gear section was the disk section and really [said] fabricated.

[Claim 10] Said gear members are the master gear of a spinning reel given in either of claims 1-9 by which the screw stop is carried out to said gear mounting section.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to master gear and the master gear of the spinning reel for being supported especially free [a revolution on the body of a reel of a spinning reel], and transmitting the revolution of a handle to Rota through a pinion gear.

[0002]

[Description of the Prior Art] Generally, the spinning reel has the body of a reel with which a fishing rod is equipped, Rota supported free [a revolution] by the body of a reel, and the spool with which it is prepared ahead of Rota and a fishing line is twisted around a periphery. Rota is rotated by the pinion gear and one which were prepared in the periphery side of a spool shaft. Order carries out both-way migration of the spool according to the oscillating device in which it has the medium gear which meshes with a pinion gear. A pinion gear meshes with the master gear which have the shank which intersects perpendicularly with a pinion gear, and is rotated by the revolution of a handle. While the shank of master gear is equipped with a handle, the contrate-gear section is prepared in the periphery.

[0003] In the large-sized spinning reel, the handle is thrust into the shank of master gear in consideration of endurance, prevention of shakiness, etc. In this case, since a partner's shank to thrust is a product made from aluminum or the reinforcement of a shank becomes it weak that it is a product made from a zinc alloy, if desorption of the handle is carried out repeatedly, a screw will tend to break. For this reason, with the large-sized spinning reel, what forged the thing and brass which inserted the shank made from a stainless alloy to metal mold, and injection molded the contrate-gear section made from zinc dies casting, and manufactured a revolving shaft and the contrate-gear section by one is mainly used conventionally.

[0004]

[Problem(s) to be Solved by the Invention] It is difficult to attain lightweight-ization of master gear with said conventional configuration, since the construction material of the contrate-gear section is zinc dies casting or is brass. Although what is necessary is just to make the whole the product made from an aluminum alloy in order to attain lightweight-ization, if the whole is made the product made from an aluminum alloy as mentioned above, the reinforcement of a shank will be weak and a screw will tend to break.

[0005] The technical problem of this invention is in the master gear of a spinning reel to attain lightweight-ization and enable it to maintain the reinforcement of a shank highly.

[0006]

[Means for Solving the Problem] The master gear of the spinning reel concerning invention 1 are supported free [a revolution] by the body of a reel of a spinning reel, are gears for transmitting the revolution of a handle to Rota through a pinion gear, and have a shank, the gear mounting section, and a gear member. A shank is supported at both ends free [a revolution] by the body of a reel, and a screw hole is formed in an ends side. The gear mounting section has the flange prepared inside the revolution supporting section of a shank. A gear member is a member which has the disk section attached in the flange of the gear mounting section at revolution impossible, and the contrate-gear section which is prepared in the periphery side of the disk section and

gears with a pinion gear.

[0007] In these master gear, the screw hole formed in the shank is equipped with a handle, and the disk section of a gear member is attached in the flange of the gear mounting section prepared in the shank at revolution impossible. For this reason, the gear member of lightweight construction material can be attached in the shank of construction material with high reinforcement through the gear mounting section. Therefore, lightweight-ization can be attained and the reinforcement of a shank can be maintained highly.

[0008] The master gear of the spinning reel concerning invention 2 are formed in invention 1 with the construction material as a shank with the same gear mounting section in the gear of a publication at one. In this case, structure becomes simple while the reinforcement of a shank is highly maintainable by using what has the high reinforcement of a stainless alloy etc. for a shank, a shank, and the really formed gear mounting section.

[0009] In a gear given in invention 2, a shank and the gear mounting section of the master gear of the spinning reel concerning invention 3 are the products made from a stainless alloy. In this case, since a shank and the gear mounting section are the products made from a stainless alloy, both reinforcement is highly maintainable. In a gear given in invention 1, the shank of the master gear of the spinning reel concerning invention 4 is a product made from a stainless alloy, and the gear mounting section is construction material different from a shank. In this case, the reinforcement of only a shank can be maintained highly and lightweight-ization of the gear mounting section can be attained.

[0010] In a gear given in invention 4, the gear mounting section of the master gear of the spinning reel concerning invention 5 is a product made of synthetic resin. In this case, since a gear member and a shank can be insulated while being able to lightweight-ize the gear mounting section, the electrolytic etching by contact of metals can be prevented. In a gear given in invention 4, the gear mounting section of the master gear of the spinning reel concerning invention 6 is a product made from a zinc alloy. In this case, by using a zinc alloy, reinforcement is maintained and the gear mounting section can be manufactured cheaply and easily.

[0011] In the gear invention 5 or given in 6, the gear mounting section is really fabricated for the master gear of the spinning reel concerning invention 7 by the shank. In this case, since projection parts, such as the gear mounting section, are lost to a shank while the adhesion reinforcement of a shank and the gear mounting section improves and the whole reinforcement becomes high by really fabricating the gear mounting section by insert molding or outsert shaping to a shank, the yield of a shank improves.

[0012] In a gear given in either of the invention 1-7, the gear member of the master gear of the spinning reel concerning invention 8 is a product made from an aluminum forging alloy. In this case, a gear member is lightweight, and since it is a product made from an aluminum forging alloy with comparatively high reinforcement, lightweight-ization of a gear can be attained. In a gear given in either of the invention 1-7, the disk section of a gear member of the master gear of the spinning reel concerning invention 9 is a product made from an aluminum forging alloy, and the contrate-gear section is the disk section and really fabricated product made from a zinc die-cast alloy. In this case, the reinforcement and precision of the contrate-gear section are highly maintainable, attaining lightweight-ization.

[0013] In the gear given in either of the invention 1-9, the screw stop of the gear member is carried out for the master gear of the spinning reel concerning invention 10 to the gear mounting section. In this case, a gear member can be easily attached in the gear mounting section with a screw at revolution impossible.

[0014]

[Embodiment of the Invention] [Whole configuration] In drawing 1 and drawing 2, the spinning reel which adopted 1 operation gestalt of this invention twists the fishing line of No. 8 about 200m, and is a possible large-sized spinning reel. The spinning reel is equipped with the handle assembly 1, the body 2 of a reel supported for the handle assembly 1, enabling a free revolution, Rota 3, and spool 4. Rota 3 is supported by the anterior part of the body 2 of a reel free [a revolution]. Spool 4 rolls round a fishing line to a peripheral face, and is arranged free [order migration] at the anterior part of Rota 3.

[0015] [Configuration of a handle assembly] As shown in drawing 3, the handle assembly 1 is a member screwed in the master-gear shaft 10, and has T character-like bundle hand part 1a and L character-like crank-arm 1b by which it was equipped with bundle hand part 1a at the head free [a revolution]. Crank-arm 1b has mounting section 7c of a screw **** sake for arm section 7a, shank 7b with which the end face of arm section 7a was equipped, enabling a free splash, and shank 7b on the master-gear shaft 10. A cross section is a rod-like member, from 1st male screw section 8a of a right screw (screw which will be closed if it turns clockwise), and 1st male screw section 8a, 2nd male screw section 8b of the left screw (screw which will be closed if it turns counter clockwise) of a major diameter arranges shank 7b in shaft orientations, and it is formed at the head (drawing 3 right end) at this heart. Thereby, all with the left location shown in the right location and drawing 3 of the body 2 of a reel shown in drawing 1 and drawing 2 can be equipped with the handle assembly 1.

[0016] Chamfer 8c which was able to stab at parallel mutually is formed in the end face of shank 7b, and 8d of pin holes for splash pin 8e wearing for supporting arm section 7a free [a splash] is formed in chamfer 8c. Shank 7b is equipped with arm section 7a by splash pin 8e free [a splash]. Mounting section 7c has press member 9c with which shank 7b was equipped between contact section 9a which consisted of end faces of arm section 7a, shaft-guard 9b of the shape of a cylinder like object with base arranged at the periphery side of shank 7b, and shank 7b and shaft-guard 9b. The pars basilaris ossis occipitalis of shaft-guard 9b is stopped by chamfer 8c of shank 7b at revolution impossible. Shank 7b can be rotated because this turns shaft-guard 9b. The head of shaft-guard 9b is arranged in the location which counters hole vacancy covering 19b prepared in the body 2 of a reel. Press member 9c is the tubed part material with which shank 7b was equipped free [a revolution] and free [shaft-orientations migration]. This head contacts the master-gear shaft 10 at the time of handle assembly 1 mounting. Between press member 9c and the pars basilaris ossis occipitalis of shaft-guard 9b, 9d of 2 sets of two belleville springs of a total of four sheets and washer 9e which a periphery side contacts arrange, and are arranged at the periphery side of shank 7b. 9d of belleville springs has prevented that it is located in the state of compression between the end face section of press member 9c, and washer 9e at the time of handle assembly 1 mounting, press press member 9c to the master-gear shaft 10 side, and a screw loosens according to compression reaction force.

[0017] if shaft-guard 9b is turned and the handle assembly 1 is loosened in such a handle assembly 1 of structure -- contact section 9a -- from shaft-guard 9b -- deserting -- crank-arm 1b -- a splash pin 8e part -- it is and bending is possible at one-touch. Conversely, if shaft-guard 9b is turned and the handle assembly 1 is fastened, contact section 9a will stick to shaft-guard 9b, and will return by one-touch. Since press member 9c is pressed by 9d of belleville springs at the master-gear shaft 10 side at this time, the handle assembly 1 stops being able to loosen easily.

[0018] [Configuration of the body of a reel] The body 2 of a reel has reel body 2a which has opening 2c in a flank, and beam mounting foot 2b of the shape of T character prolonged in one ahead [slanting up] from reel body 2a. Opening 2c is closed by covering device material 2d. Reel body 2a has the space for device wearing which stands in a row in opening 2c inside, as shown in drawing 2, and in the space, the Rota drive 5 which is interlocked with a revolution of the handle assembly 1 and is made to rotate Rota 3, and the oscillating device 6 for moving spool 4 forward and backward and rolling round a fishing line to homogeneity are established.

[0019] As shown in drawing 3 and drawing 4, tubed boss section 17a is formed in the right lateral of reel body 2a. Boss section 17a is projected and formed in the way among reel body 2a, in order to contain bearing 16a which supports the right end of the master-gear shaft 10. Boss section 17b is formed in the location which counters boss section 17a of covering device material 2d. Boss section 17b is projected and formed in the method of inside and outside of reel body 2a in order to contain bearing 16b which supports the left end of the master-gear shaft 10. The boss section by the side of the reverse equipped with the handle assembly 1 (drawing 3 boss section 17a) is blockaded by shaft-guard 19a. As for the boss section (drawing 3 boss section 17b) of the side equipped with the handle assembly 1, trespass of water is prevented by hole vacancy covering 19b. As shown in drawing 1, shaft-guard 19a and hole vacancy covering

19b are the members of an ellipse form, and are attached in the boss section by two bis-19c, respectively. In addition, hollow 17c of the ellipse form for equipping with shaft-guard 19a and hole vacancy covering 19b flat-tapped is formed in boss section 17a which does not project in the method of outside.

[0020] [Configuration of the Rota drive] The Rota drive 5 has the master gear 11 by which revolution impossible was equipped with the handle assembly 1, and the pinion gear 12 which meshes with these master gear 11, as shown in drawing 3. Master gear 11 have the master-gear shaft 10, the master-gear shaft 10, really formed gear mounting section 11a, and gear member 11b with which gear mounting section 11a was equipped free [attachment and detachment], as shown in drawing 4.

[0021] The master-gear shaft 10 is the member of the hollow made from stainless steel, and the ends are supported by reel body 2a and covering device material 2d free [a revolution] through Bearing 16a and 16b. Bearing 16a and 16b is anti-friction bearing which has inner-ring-of-spiral-wound-gasket 20a, outer-ring-of-spiral-wound-gasket 20b, and ball 20c, and inner-ring-of-spiral-wound-gasket 20a of Bearing 16a and 16b and outer-ring-of-spiral-wound-gasket 20b, and the peripheral face of the master-gear shaft 10 are contacted for example, equipped with the seal rings 18a and 18b made from elastic bodies, such as NBR, on the shaft-orientations outside, respectively.

[0022] Seal rings 18a and 18b are washer-like members, and the seal wearing space 18c and 18d formed in the outside of Bearing 16a and 16b is stuck and equipped with them. A seal wearing space [18c and 18d] bore (outer diameter of seal rings 18a and 18b) is smaller than the outer diameter of Bearing 16a and 16b. Moreover, shaft-orientations die length is a little smaller than the thickness of seal rings 18a and 18b. The inner circumference edge of seal rings 18a and 18b touches the sealing surfaces 10e and 10f of the master-gear shaft 10. A these sealing surfaces [10e and 10f] outer diameter is smaller than the outer diameter (bore of Bearing 16a and 16b) of a bearing wearing side.

[0023] Bis-18e and 18f are thrust into the boss sections 17a and 17b in the inside of outer-ring-of-spiral-wound-gasket 20b of Bearing 16a and 16b. Seal rings 18a and 18b are held down by outer-ring-of-spiral-wound-gasket 20b within seal wearing space 18c and 18d by this bis-18e and 18f, and while the seal in a seal periphery part becomes possible, corotation with the master-gear shaft 10 is prevented. Moreover, since a minor diameter [sealing surfaces 10e and 10f / side / bearing wearing], while sealing surfaces 10e and 10f stop being able to get damaged easily, even if the end face of the master-gear shaft 10 blisters by repeating mounting by the bell and spigot of the handle assembly 1, it is not hard coming to escape Bearing 16a and 16b. Furthermore, since a minor diameter [the seal wearing space 18c and 18d / b / outer-ring-of-spiral-wound-gasket 20], the thrust force of acting on Bearing 16a and 16b can be directly received by reel body 2a or covering device material 2d.

[0024] As shown in drawing 4, the 10d of the 2nd female screw sections which carry out opening to order from a right end (drawing 4 right-hand side) at 1st breakthrough 10a, 1st female screw section 10b, 2nd breakthrough 10c, and a left end arranges to shaft orientations, and they are formed in the core of the master-gear shaft 10 at this heart. The shaft-orientations die length of 1st breakthrough 10a is mostly formed by the same die length with the shaft-orientations die length of the 10d of the 2nd female screw sections. The 1st breakthrough 10a diameter is formed so that it may be a major diameter and 2nd male screw section 8of shank 7b b can be inserted in from the 10d of the 2nd female screw sections. 1st female screw section 10b is a right screw screwed in 1st male screw section 8a of shank 7b. The shaft-orientations die length is more slightly [than 1st male screw section 8a] long. The shaft-orientations die length of 2nd breakthrough 10c is mostly formed by the same die length with the shaft-orientations die length of 1st female screw section 10b. The diameter of 2nd breakthrough 10c is formed so that it may be a major diameter and 1st male screw section 8a can be inserted in from 1st female screw section 10b. The 10d of the 2nd female screw sections is the left screw screwed in 2nd male screw section 8of shank 7b b.

[0025] In the peripheral face of the master-gear shaft 10, 10g of parallel chamfers formed face to face is formed in the gear mounting section 11a formation location. Gear mounting section

11a is formed in 10g of this chamfer by outsert shaping at one. Gear mounting section 11a is the product made from a zinc alloy which is really easy to fabricate to a stainless alloy. Gear mounting section 11a has 11d of flanges formed in the periphery side of boss section 11c which fixed on the master-gear shaft 10, and boss section 11c. 11d of this flange is equipped with gear member 11b free [attachment and detachment] with two or more bolts 13.

[0026] Gear member 11b is the disc-like member which used the aluminum forging alloy, in order to attain lightweight-ization. Gear member 11b has 11f of contrate-gear sections which are prepared in the periphery side of disk section 11e attached in 11d of flanges at revolution impossible, and disk section 11e, and gear with the pinion gear 12. As shown in drawing 2 , the pinion gear 12 is a tubed member, it is arranged along with a cross direction and reel body 2a is equipped with it free [a revolution]. Anterior part 12a of the pinion gear 12 has penetrated the core of Rota 3, and is being fixed with Rota 3 with the nut 33 in this penetration part. The pinion gear 12 is supported by reel body 2a free [a revolution] through Bearing 14a and 14b, respectively in the pars intermedia and the back end section of shaft orientations. The spool shaft 15 has penetrated the interior of this pinion gear 12. The pinion gear 12 meshes also in the oscillating device 6 while meshing with master gear 11.

[0027] [Configuration of Rota] Rota 3 has the body 30 fixed to the pinion gear 12, the 1st and 2nd Rota arms 31 and 32 which countered the side of a body 30 mutually and were prepared in it, and the bail arm 40 as a fishing line advice device for showing a fishing line to spool 4, as shown in drawing 2 . A body 30 and both the Rota arms 31 and 32 are for example, the products made from an aluminum alloy, and it is really fabricated. A part for the head core of a body 30 is being fixed to the point of the pinion gear 12 by revolution impossible with the nut 33 as mentioned above.

[0028] The front wall 41 is formed in the anterior part of a body 30, and the boss section 42 is formed in the core of a front wall 41. The breakthrough stopped by the pinion gear 12 at revolution impossible is formed in the core of this boss section 42, and anterior part 12a of the pinion gear 12 and the spool shaft 15 have penetrated this breakthrough. The boss section 42 is adjoined and the inversion prevention device 50 is arranged inside the body 30. The inversion prevention device 50 has the one-way clutch 51 of the roller type with which the inner ring of spiral wound gasket with which the pinion gear 12 was equipped at revolution impossible idles, and the change-over device 52 which switches an one-way clutch 51 to an operating state (inversion prohibition condition) and a non-operating state (inversion authorized state).

[0029] [Configuration of an oscillating device] The oscillating device 6 has **** 21 arranged at parallel at the method of directly under [abbreviation] of the spool shaft 15, the slider 22 which moves to a cross direction along with **** 21, and the medium gear 23 fixed at the head of **** 21, as shown in drawing 2 and drawing 3 . The slider 22 is supported free [migration on **** 21 and two guide shafts 24 arranged at parallel]. The back end of the spool shaft 15 is being fixed to the slider 22 by revolution impossible. The medium gear 23 meshes with the pinion gear 12.

[0030] [Configuration of a spool] As spool 4 is shown in drawing 2 , it is arranged between the 1st Rota arm 31 of Rota 3, and the 2nd Rota arm 32, and the core of spool 4 is connected with the point of the spool shaft 15 through the drag device 60. The spool 4 has spool drum section 4a by which a fishing line is wound around a periphery, skirt-board section 4b formed in the back of spool drum section 4a by one, and flange plate 4c fixed to the front end of spool drum section 4a. Spool drum section 4a is a cylinder-like member, and the peripheral face consists of peripheral surfaces parallel to the spool shaft 15.

[0031] [Actuation of a reel and actuation] In this spinning reel, the bail arm 40 is pushed down on a yarn disconnection position at the time of the yarn deliveries at the time of casting etc. Consequently, it lets out a fishing line sequentially from the head side of spool 4 with the self-weight of a mechanism. At the time of yarn winding, a bail arm is returned to a yarn winding position side. If this rotates the handle assembly 1 in the yarn winding direction, it will be automatically performed by work of the bail reversal device which is not illustrated. The turning effort of the handle assembly 1 is transmitted to the pinion gear 12 through the master-gear shaft 10 and master gear 11. The turning effort transmitted to the pinion gear 12 is transmitted to the oscillating device 6 by the medium gear 23 which meshes with the pinion gear 12 while it

is transmitted to Rota 3 from the anterior part. Consequently, while Rota 3 rotates in the yarn winding direction, spool 4 carries out both-way migration in order.

[0032] Here, the master gear 11 of the Rota drive 5 which transmits a revolution of the handle assembly 1 to Rota 3 consist of a master-gear shaft 10 made from a stainless alloy with high reinforcement, gear mounting section 11a made from a zinc alloy, and lightweight gear member 11b made from an aluminum forging alloy. For this reason, reinforcement can be maintained highly and master gear 11 can be lightweight-ized. Moreover, there are few possibilities that the attachment and detachment of the handle assembly 1 by which screw association is carried out may be repeated, a screw thread is crushed, an integrated state may become sweet or corrosion resistance may deteriorate [the surface treatment film may exfoliate and] as a line.

[0033] Operation gestalt] besides [

(a) With said operation gestalt, although gear mounting section 11a was made the product made from a zinc alloy, high intensity synthetic resin like polyacetal resin may be used. Also in this case, you may the master-gear shaft 10 and really fabricate with insert molding or outsert shaping.

(b) With said operation gestalt, although gear mounting section 11a was the master-gear shaft 10 and really fabricated, the master-gear shaft 10 may be equipped with what was manufactured independently by proper means for detachable, such as adhesion and serration association.

[0034] (c) In said operation gestalt, although the master-gear shaft 10 and gear mounting section 11a were made into another construction material, as shown in drawing 5 , you may form with the same construction material. In this case, it is desirable to use a stainless alloy or its forging, and a brass forging as construction material.

(d) Although disk section 11e of gear member 11b and 11f of contrate-gear sections were manufactured with the same aluminum forging with said operation gestalt, as shown in drawing 6 , disk section 11e may be manufactured with an aluminum alloy, and 11f of contrate-gear sections made from zinc dies casting may really be fabricated by the technique of insert molding, outsert shaping, etc. in the periphery section.

[0035]

[Effect of the Invention] Since the disk section of a gear member is attached in the flange of the gear mounting section prepared in the shank at revolution impossible according to this invention, the gear member of lightweight construction material can be attached in the shank of construction material with high reinforcement through the gear mounting section. Therefore, lightweight-ization can be attained and the reinforcement of a shank can be maintained highly.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The left side view of the spinning reel which adopted 1 operation gestalt of this invention.

[Drawing 2] The right lateral sectional view.

[Drawing 3] The tooth-back sectional view.

[Drawing 4] The cross-section enlarged drawing of master gear.

[Drawing 5] Drawing equivalent to drawing 4 of other operation gestalten.

[Drawing 6] Drawing equivalent to drawing 4 of other operation gestalten.

[Description of Notations]

1 Handle Assembly

2 Body of Reel

3 Rota

10 Master-Gear Shaft

11 Master Gear

11a Gear mounting section

11b Gear member

11c Boss section

11d Flange

11e Disk section

11f Contrate-gear section

[Translation done.]